



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 6

1445 ROSS AVENUE, SUITE 1200
DALLAS, TEXAS 75202 – 2733

July 8, 2019

Mr. Miguel Montoya
Quality Assurance Officer
New Mexico Environment Department
Surface Water Quality Bureau
P.O. Box 5469
Santa Fe, NM 87502-5469

Dear Mr. Montoya:

We have reviewed the Quality Assurance Project Plan (QAPP) entitled “*Water Quality Monitoring to Determine Pollutant Loading Sources for the Development of the Sapello River Watershed Based Plan*” for Clean Water Act 319 Cooperative Agreement C6-996101-18. I am pleased to inform you that it was approved on July 5, 2019.

This new QAPP will expire on December 31, 2021. Should there be any changes to the QAPP at any time, please submit a revised document to EPA for approval. If the project continues under a new cooperative agreement and there are no substantive technical or programmatic changes, please submit a letter stating that no changes are needed. The letter or revised document is due at least 60 days prior to the expiration date.

Attached is the completed QAPP signature page for your records. In any future correspondence relating to this QAPP, please reference QTRAK #19-330. If you have any questions, you may contact me at (214) 665-2773.

Sincerely,

Leslie C. Rauscher

Leslie Rauscher
Project Officer
State/Tribal Programs Section

Attachment; sent via email, no hardcopy to follow.

Quality Assurance Project Plan
Water Quality Monitoring to Determine Pollutant Loading Sources
for the Development of the
Sapello River Watershed Based Plan

Clean Water Act Section 319 Grant No. 996101-18
Sub-Grant 667-393-1A

Submitted by
New Mexico Environment Department

A. PROJECT MANAGEMENT

A1. Approval

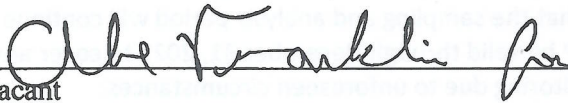


Abe Franklin

Program Manager, SWQB Watershed Protection Section

5/23/2019

Date

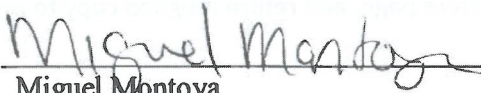


Vacant

Project Officer, SWQB Watershed Protection Section

5/23/2019

Date

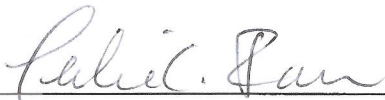


Miguel Montoya

Quality Assurance Officer, SWQB

5/28/2019

Date

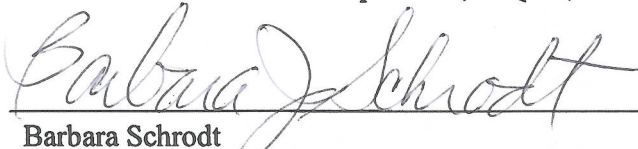


Leslie Rauscher

Environmental Protection Specialist, WQPD, EPA Region 6

7/5/19

Date



Barbara Schrodt

Chief, State and Tribal Programs Section, WQPD, EPA Region 6

7/5/19

Date

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ACRONYMS

AU	Assessment Unit
BEHI	Bank Erodibility Hazard Index
DQO	Data Quality Objective
DQI	Data Quality Indicators
EPA	United States Environmental Protection Agency
HPWA	Hermit's Peak Watershed Alliance
NMED	New Mexico Environment Department
NMRAM	New Mexico Rapid Assessment Method
QAPP	Quality Assurance Project Plan
QA	Quality Assurance
QAO	Quality Assurance Officer
SWQB	Surface Water Quality Bureau
TBD	To Be Determined
TMDL	Total Maximum Daily Load
TSS	Total Suspended Solids
WBP	Watershed Based Plan
WQPD	Water Quality Protection Division

A3. Distribution List

Table 1 below contains the distribution list, and project roles and responsibilities for this project. The QA Officer (QAO) will ensure that copies of this QAPP and any subsequent revisions are distributed to individuals who have signature authority to approve this QAPP. The SWQB Project Officer will ensure that copies of the approved QAPP and any subsequent revisions are distributed to all other project personnel listed in Table 1. All members of the distribution list who do not have signature authority to approve this QAPP will review the QAPP and sign the Acknowledgment Statement prior to initiating any work for this project. The signed Acknowledgement Statements (electronic or hard copy) will be collected by the QAO for filing with the original approved QAPP.

Table 1. Distribution List and Project Roles and Responsibilities

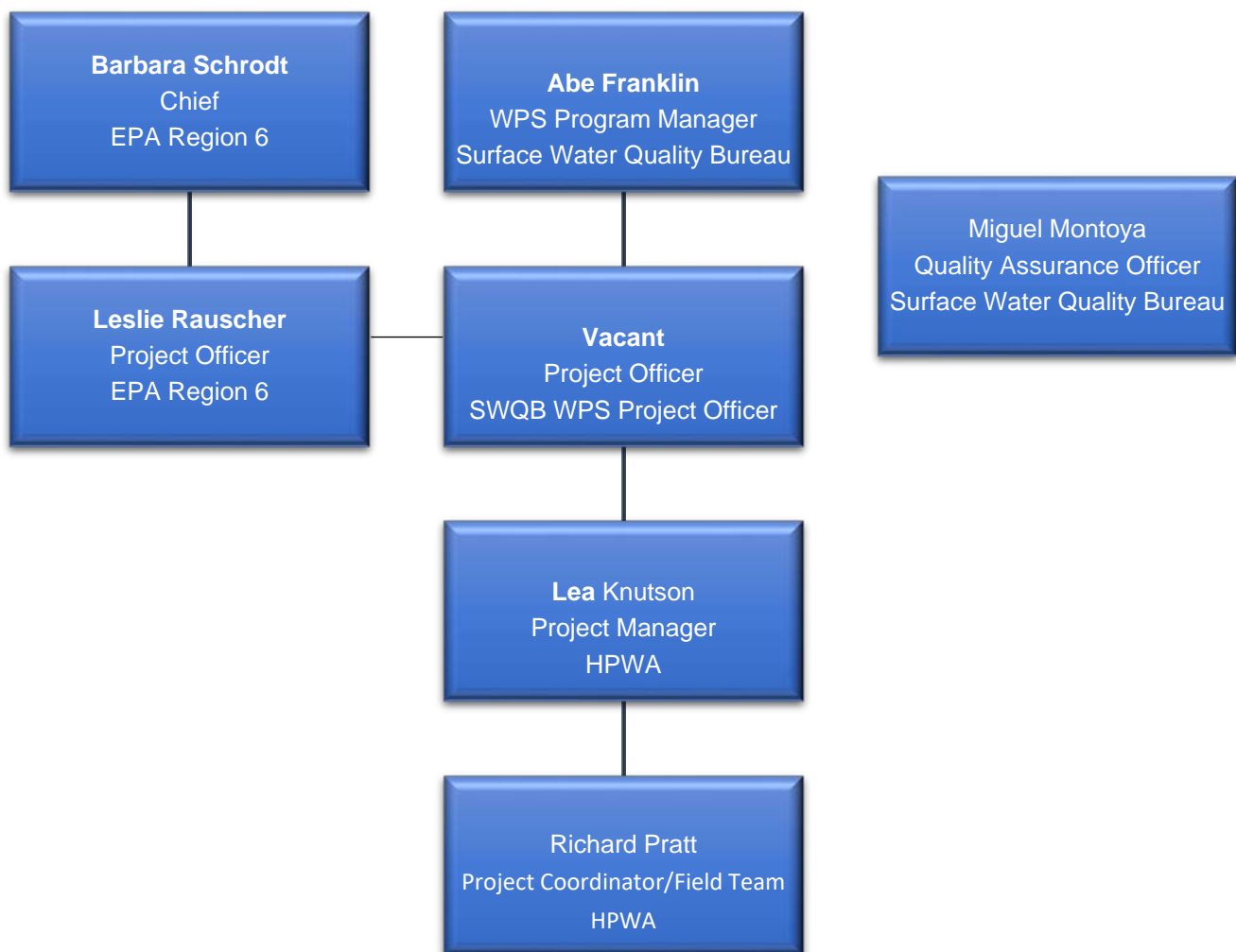
Name	Organization	Title/Role	Responsibility	Contact Information
Abe Franklin	SWQB	WPS Program Manager	Reviewing and approving QAPP, managing project personnel and resources.	(505) 827-2793 abraham.franklin@state.nm.us
Miguel Montoya	SWQB	QAO	Reviewing and approving QAPP, QA audits as needed to assure adherence to the approved QAPP.	(505) 827-2637 miguel.montoya@state.nm.us
TBD	SWQB	Project Officer/Field team/Trainer	Manage progress of project, preparing QAPP, project reporting, coordinating with contractors maintains project files, prepares final project report etc., data collection, training	
Lea Knutson	HPWA	Project Manager	Project Oversight, Verification and Validation of field data	(505) 425-5514 lknutson@hermitspeakwatersheds.org
Richard Pratt	HPWA	Project Coordinator, Field team	Oversee field monitoring team in data collection and record keeping. Reporting to Project Manager. TSS sample collection and field surveys data collection	(435) 669-4052 rpratt@hermitspeakwatersheds.org

Leslie Rauscher	EPA	Project Officer Region 6	Reviewing and approving QAPP	(214) 665-2773 rauscher.leslie@epa.gov
Barbara Schrodt	EPA	Chief, Region 6	Reviewing and approving QAPP	(214) 665-6793 barbara.schrodt@epa.gov

A4. Project Organization

The SWQB Quality Management Plan (NMED/SWQB. 2019) documents the independence of the QAO from this project. The QAO is responsible for maintaining the official approved QAPP. A project organizational chart (Figure 1) displays hierarchy of the project.

Figure 1. Organization Chart Sapello Watershed Base Plan Monitoring Project



A5. Problem Definition/Background

The Sapello River is part of the Canadian River watershed, located in northeastern New Mexico. The Sapello River is 27.39 miles long and the watershed is 289.3 square miles. More than half of the area is rangeland and 44% of land use is forest. The main tributary to the Sapello River is the Manuelitas Creek.

A TMDL for sedimentation/siltation approved by the EPA in 2007 states that the Sapello River (Mora River to Manuelitas Creek) exceeded sedimentation/siltation targets in multiple field tests conducted in 2002 by NMED SWQB. The TMDL recommends a total load reduction of 80.8 lbs/day of TSS. The pollutant source summary for the Sapello River (Mora River to Manuelitas Creek) identifies 56% magnitude nonpoint source pollution on the Sapello River. The TMDL indicated that there is no point source pollution on the river.

According to the EPA Grants Reporting and Tracking System (GRTS) past 319(h) funded projects in the Mora Watershed include two implementation projects conducted by Tierra Y Montes SWCD entitled ‘Sapello Watershed Restoration Project’ completed in 2005 (Project 02-J) and ‘Sapello Watershed Restoration Project Phase II’ completed in 2010 (Project 07-F). Additionally, HPWA completed the ‘Watershed Based Plan for the Mora River – Upper Canadian Plateau’ (Project 13-D) in 2016. The implementation projects focused on the Manuelitas sub-watershed to reduce sediment loading to the Sapello River. HPWA will utilize and build upon the information from these projects in any efforts we undertake in the Sapello sub-watershed. While sediment data are adequate to substantiate this impairment, data on the probable sources are lacking. Assessments of probable sources were not conducted in the past nor did post-treatment monitoring occur to determine resultant load reductions. This QAPP addresses data collection that will help fill data gaps.

This project intends to identify sources of impairment on the Sapello River with data collection activities for the development of the WBP. The SWQB Monitoring, Assessment, and Standards Section may use the data for future assessment purposes of the Sapello River.

While the focus of this monitoring project is on the sediment impairment of the Sapello River, the larger Sapello River Watershed-Based Plan project include the Rito San Jose and Manuelitas Creek as streams of interest. The Rito San Jose was listed as impaired by low flow in the *2016-2018 State of New Mexico CWA §303(d)/§305(b) Integrated Report* Appendix A. Although it is no longer listed in the 2018-2020 version of this list, HPWA will conduct research and general field investigation of the Rito San Jose watershed to better characterize flow conditions in that tributary. Manuelitas Creek and its subwatershed will be evaluated as a potential source area for sediment to the Sapello River.

With more comprehensive ecological functions of reaches within the Sapello Watershed, the Sapello River WBP will address goals set forth in the EPA’s Healthy Watersheds Initiative and facilitate the framework for future restoration plans for improving water quality by addressing sources of impairment.

Objective

The purpose of the Project is to collect data which identifies sources of impairment for sedimentation/siltation for the development of the Sapello River WBP. This data will drive goals and strategies to improve water quality during implementation phases within the Sapello Watershed (USGS HUCs 110800040201, 110800040202, 110800040203, 110800040204, 110800040205, 110800040206, 110800040207 and 110800040208).

When changes affect the scope, implementation or assessment of the outcome, this QAPP will be revised to keep project information current. The SWQB Project Officer, with the assistance of the QAO, will determine the impact of any changes on the technical and quality objectives of the project. This Project Plan will be reviewed annually by the SWQB Project Officer to determine the need for revision.

A6. Project/Task Description

Description

The Sapello River Monitoring Project will collect total suspended solids (TSS), stream flow, physical habitat, and conduct a bank erosion assessment to determine sources of impairment on the Sapello River. This data will be used for the development of the Sapello River WBP which will identify future implementation projects for water quality improvement. The data collected in the development of the WBP can also be used as post-implementation baseline data for future effectiveness monitoring and for future assessment by the SWQB. See Table 2 for products and timelines associated with the project.

Schedule

The HPWA will utilize four (4) existing monitoring sites established by the SWQB, within the Sapello Watershed for continuous targeted monitoring for the development of the WBP. According to the SWQB Mapper all four (4) monitoring sites appear to be within private property, however, three of these sites are located near highways and should be accessible. The HPWA will work to obtain permission to access the fourth site. Additional monitoring site locations will be strategically selected as HPWA gains permission to access private land holdings so that potential probable source can be identified or eliminated as contributing factors to impairment. See Table 3 for waterbody attributes and monitoring locations for the Sapello WBP.

Total Suspended Solid (TSS) sampling will be conducted no less than two (2) times at each of the monitoring sites between August 15 and November 15 each year. Data derived from the results of TSS analysis can be expressed as stream bottom deposits using the equations stated in the EPA approved TMDL for the Canadian River Watershed (2007). The TSS results can then be used to determine if the water body is above or below target loads for stream bottom deposits. The TSS concentrations results may also be used to determine if the waterbody is meeting NM water quality standards according to the Canadian River Watershed TMDL (2007).

Sonde Deployment (YSI 6920 VS) consist of the collection of instantaneous measurements conducted at the same time as, or shortly after, TSS sampling. Sonde instruments contain multi-parameter probes that can collect data for pH, specific conductivity, dissolved oxygen concentration, percent dissolved oxygen, and turbidity. Turbidity will be looked at in relation to TSS to determine a load in pounds per day (lb/day) for each site. This will determine if the waterbody is meeting water quality standards according to the Canadian River Watershed TMDL (2007).

Physical Habitat Measurements (stream morphology) will be conducted once during each monitoring year from August 15 to November 15 at each monitoring site independently from TSS grab samples and sonde deployment. The data derived from the physical habitat measurements can be used in future assessments on the Sapello River to identity sedimentation/siltation impairment. The physical habitat assessment will be used to determine if there is excessive sedimentation/siltation at each monitoring site. A level 1 assessment will be used to determine if the percent (%) sands and fines exceeds the site class threshold. If the site exceeds this threshold, a level 2 assessment will be conducted. The level 2 assessment will answer the questions, “is the amount of fine sediment expected or likely anthropogenic” and if “the stream bed is stable” (NMED/SWQB. 2017). If a level 2 assessment is needed, both level 1 and level 2 assessments will be done at the same time whenever possible to reduce the influence of seasonal variability.

Stream flow will be collected in conjunction with sonde deployment and physical habitat measurements at all monitoring sites. Sediment transport in a stream varies as a function of flow. As flow increases, the amount of sediment being transported increases. There is no USGS gage located on this river. Therefore, flow will be collected in order to determine target loads for this reach of river.

Bank Erodibility Hazard Index (BEHI) is a procedure that is used for assessing streambank erosion condition and potential. This index can be used to inventory stream bank condition of large areas and help prioritize eroding banks that need restoration. Site locations to complete BEHI will be determined upon the completion of a stream visual assessment, sites will be determined based on reference conditions, and locations where visual identification of degraded stream banks are found. The BEHI assessment will help identify and eliminate potential sources for the sedimentation/siltation impairment on the Sapello River. BEHI assessment procedure will be completed once at each site identified.

Table 2. Products and Timeline

Task	Timelines	Product
Complete QAPP	June 2019	Complete Quality Assurance Project Plan ensuring measures are in place to collect quality data.

Collect TSS samples, sonde instantaneous measurements and record stream flow data.	August 15 to November 15	Total Suspended Solids data along with Sonde and Stream flow data for each monitoring locations.
Conduct stream morphology.	Once yearly for all monitoring years from August 15 to November 15. Conducted during same time of year throughout project.	Pebble count, cross-section, large woody debris, and slope. Transects monumented for future data collection efforts with GPS unit.
BEHI Model Analysis	Spring 2019 to Summer 2021	Collect data and run model to determine if and where streambanks are prone to high rates of erosion. This can help identify sediment sources.
Final Report	June 2021	Complete Sapello Watershed Based Plan

Figure 2. Sapello Watershed Area and monitoring sites.

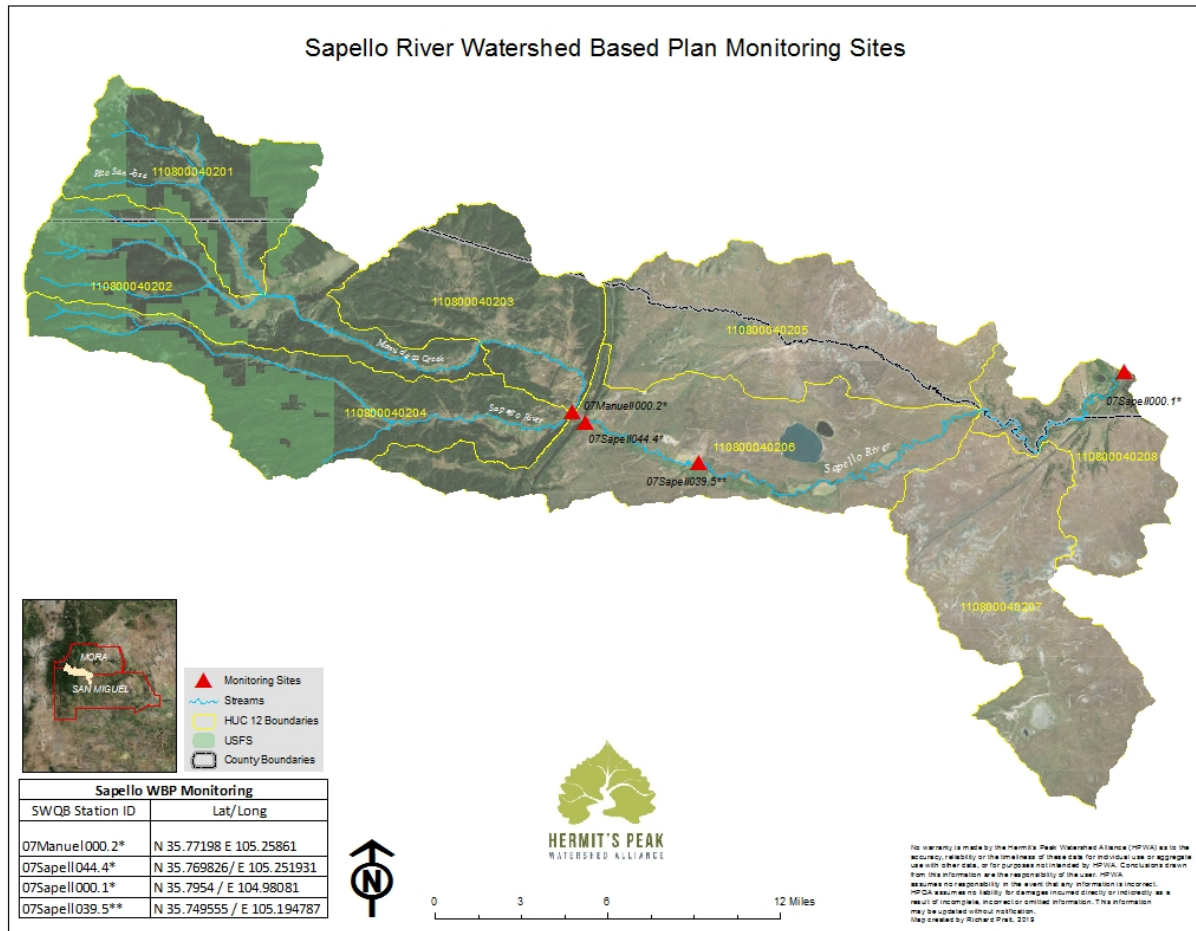


Table 3. Waterbody Attributes for the Sapello Watershed Based Plan

Waterbody	Assessment Unit ID	Monitoring Station Id	12-Digit HUC	12-Digit HUC Name
Rito San Jose	NM-2305.3.A_22	TBD	110800040201	Manuelitas Creek to Headwaters
Manuelitas Creek	NM-2305.3.A_21	TBD	110800040202	Sapello River to Rito San Jose Creek
Manuelitas Creek	NM-2305.3.A_21	07Manuel000.2*	110800040203	Sapello River to Rito San Jose Creek
Sapello River	NM-2305.A_30	TBD	110800040204	Manuelitas Creek to Headwaters
Sapello River	NM-2305.3.A_23	07Sapell044.4*	110800040206	Arroyo Jara to Manuelitas Creek
Sapello River	NM-2305.3.A_23	07Sapell039.5**	110800040206	Arroyo Jara to Manuelitas Creek
Sapello River	NM-2305.A_20	07Sapell000.1*	110800040208	Mora River to Arroyo Jara

*Continuous targeted monitoring sites for the development of the WBP.

** Continuous targeted monitoring site for the development of the WBP pending landowner permission.

A7. Quality Objectives and Criteria for Measurement Data

Question/Decision

The Sapello Watershed Based Plan Monitoring Project is intended to answer the following questions: (1) Does the Sapello River still have a sedimentation/siltation impairment, (2) where are potential sources of sediment coming from, (3) are these sources natural or anthropogenic, and (4) where are the high priority areas for future restoration work to reduce sedimentation loads on the Sapello River?

Stated as a decision: The information gathered by the Sapello Watershed Based Plan Monitoring Project will be used to create the Sapello River WBP. This information will drive goal and future implementation projects that will potentially improve water quality within the watershed. If future restoration work is successful, sedimentation/siltation in the Sapello River will be reduced, satisfy the TMDL requirements and lead to a delisting of the impaired AU.

Data Quality Objective

The quality of the data will be collected according to Standard Operating Procedures (See section B2) in order to provide a high level of confidence in the development of the WBP and will be used to determine the effects of future restoration on the Sapello River.

Measurement Quality Objectives

The measurement quality objectives will be sufficient to achieve the DQO and will be in conformance with those listed in the SWQB QAPP (*Water Quality Management Programs* 2018c). The Data Quality Indicators listed in the SWQB's QAPP applicable to the data collected for this project are precision, accuracy, bias, representativeness, comparability, and completeness.

DQI	Determination Methodologies
Precision	will be ensured by using the standardized procedures identified in this QAPP. Having two trained field team members present at all time while collecting data. Analytical methods for TSS and method reporting limits for the laboratory will be within a sensitivity that is able to report below the established thresholds.
Accuracy	the basis for determining accuracy will be staff's expertise of the survey method for collecting data and ensuring the accuracy of the equipment being used is within the required range of a particular survey.
Bias	is to reduce the systematic or persistent distortion of any measurement process, bias will be minimized by using professional and experienced staff to collect and analyze data.

Representative	monitoring location will be chosen based on proximity of assumed probable sources and potential impact on water quality with emphasis on identifying potential sources of impairment.
Comparability	monitoring locations will be monumented for repeat sampling events to compare pre- and post-treatment data. Methods listed under this QAPP for data collection are standardized and reproducible with the intent to be comparable to other studies.
Completeness	surveys and methodologies will be completed in their entirety as identified in this QAPP.

A8. Special Training/Certification

This project will be primarily implemented by HPWA personnel or monitoring contractor who will be trained by the appropriate SWQB staff in coordination with the SWQB Project Officer and the QAO. The SWQB staff conducting the training will have signed the required SOP acknowledgment forms and will conducted training in accordance with the procedures identified in SOPs referenced in this QAPP. **Stream morphology will not be collected for the development of the Sapello WBP until the SWQB has conducted training with HPWA primary data collector and/or monitoring contractor.** No further specialized training is required for HPWA staff working under this project. Training of field assistants, student interns and cooperating personnel will be conducted in the field with hands-on training and will be led by qualified NMED SWQB staff. Field assistants, student interns and cooperating personnel will be accompanied by HPWA staff when collecting samples or field measurement until such time the Project Manager determines that the individual can carry out data collection activities in accordance with the procedures identified in SOPs referenced in this QAPP.

A9. Documents and Records

The SWQB Project Officer will make copies of this QAPP and any subsequent revisions available to all individuals on the distribution list who do not have signature authority to approve this QAPP.

Project documents include this QAPP, field notebooks, calibration records, validation and verification records, sample collection data, records of analytical data in hard copy or in electronic form and QC records. Also, included as project documents are project interim and final reports.

All personnel involved with data collection will use NMED SWQB data sheets to collect in-field data. Field personnel will submit copies of field notes and samples to the Project Coordinator at the end of each field survey. Metadata associated with analytical samples will be documented on the field data sheets and on the chain of custody documents. Metadata will include, at a minimum, the date, time, ambient water temperature, staff present during sampling, location with latitude and longitude coordinates, media collected, volume collected, sample reference ID, parameter sampling for, as well as preservation used. The Project Coordinator will take analytical samples to the laboratory for analysis along with chain of custody documents for laboratory to complete.

Analytical reports and associated laboratory QA documents will be submitted to the Project Coordinator who will provide a copy to the SWQB Project Officer for the project file. Project Coordinator will require the laboratory to provide any other reporting definition pertaining to results from analysis. The Project Coordinator will also require the laboratory to report results of analysis in an electronic data deliverable format as well as a narrative report in a certified portable document format (pdf).

The Project Coordinator will provide copies of all applicable project documents to the SWQB Project Officer who will record and file the documents in the project file at the SWQB office in Santa Fe, NM. All electronic data provided to the SWQB Project Officer will be stored on the SWQB network drive in appropriate project file.

All final reports generated by the SWQB Project Officer will be provided to EPA and a copy will be placed in the project file on the SWQB network drive. Documents held by the SWQB Project Officer will be maintained in accordance with the requirements of the SWQB's QAPP Documentation and Records section.

B. DATA GENERATION AND ACQUISITION

B1. Sampling Process Design

The study design will consist of four (4) monitoring sites established by the SWQB, monitoring sites are located upstream and downstream of tributary confluences on the Sapello River. These four (4) monitoring sites will be utilized during the course of this project. Additional monitoring locations will be identified after conducting interviews with landowners, a stream visual assessment, selected based on potential probable sources of impairment, and strategically selected so that other potential probable source can be eliminate as contributing factors to impairment. Monitoring will be conducted at locations representative of ambient stream conditions, generally in the transition between a riffle/run and a pool, or at the toe of a pool, rather than in shallow riffles or deep pools.

The Field Team (Project Coordinator and intern, and/or monitoring contractor) will collect TSS grab samples in accordance with SWQB SOP 8.2, *Chemical sampling in Lotic Environments* (NMED/SWQB 2015a). All applicable sections of SWQB SOP 8.2 will be adhered to during TSS sample run. A sample run is defined as a 24-hour period where all monitoring sites are sampled or visited. TSS grab samples will be collected at all monitoring sites during a sample run (if stream flow is sufficient to obtain sample). A minimum of two (2) different sample runs will occur between August 15 and November 15 at the beginning and the end of the contractual period. Sample runs will consistently occur during same month for each monitoring year.

Field Team will collect instantaneous measurements with sonde at all monitoring sites in accordance with the SWQB SOP 6.2, *Sonde Deployment* (NMED/SWQB. 2018b). Instantaneous measurements collected during sonde deployment will occur during sample run for TSS sample collection. The sonde will provide instantaneous measurement of the following field parameters during sampling events: temperature, pH, specific conductivity, dissolved oxygen concentration, percent dissolved oxygen, and turbidity.

The Field Team will collect stream morphology metrics in accordance with the SWQB SOP 5.0, for *Physical Habitat Measurements* (NMED/SWQB. 2016b). The Field Team will always consist of at least two persons while conducting surveys. A level 1 assessment (pebble count) will be initially conducted using the pebble count procedure identified in the SWQB's SOP for Physical Habitat Measurements. If the pebble count procedures result in an exceedence of the threshold for percent (%) sands and fines associated with site class (e.g. Mountain Sediment Site Class, Foothill Sediment Site Class, or Xeric Sediment Site) for monitoring site, a level 2 assessment will be conducted the same day. A level 2 assessment, if needed, will include thalweg profile, cross-section, large woody debris tally and slope. Cross-sections will be monumented with rebar pins (right bank and left bank) for repeatability. Rebar locations will be recorded with a GPS unit for accuracy and verification for later sampling events. Physical habitat measurements will be collected at each monitoring locations during base flow conditions, between August 15 and November 15. Stream morphology assessments will be taken independently from TSS grab samples.

The Field Team will collect stream flow at all monitoring locations in conjunction with TSS sampling after sonde measurements have been collected and recorded. Stream flow will also be collected in conjunction with all level 2 physical habitat assessments. Stream flow will be collected with a USGS Pygmy Current Meter in accordance with the SWQB SOP 7.0, *Stream Flow Measurement* (NMED/SWQB. 2015b).

BEHI (D. Rosgen) will be used to assess the condition of channel banks and their potential for erosion. Monitoring location and frequency will be selected based on the visual stream assessment, the identification of potential probable sources and guidance from the SWQB Project Officer.

B2. Sampling Methods

TSS Sampling will be conducted in accordance with SWQB SOP 8.2, *Chemical sampling in Lotic Environments* (NMED/SWQB. 2015a). All applicable sections of SWQB SOP 8.2, for TSS sampling will be adhered to during TSS sample collection which includes the sections on Quality Control, Collecting Water Samples, Sample Collection and Processing for Specific Parameters specifically Total Suspended Solids (TSS), and Handling, Packaging and Transporting Samples.

Sondes will be deployed at monitoring locations in accordance with the SWQB SOP 6.2 *Sonde Deployment* (NMED/SWQB. 2018b). Sonde Deployment protocol will follow the Step-by-step Process section identified in SWQB SOP 6.2 and will gather instantaneous measurement in accordance with section pertaining to Instantaneous Measurements (All Units).

Stream morphology conditions will be assessed using the SWQB SOP 5.0, *Physical Habitat Measurements* (NMED/SWQB. 2016b). Procedures for data collection are identified in sections pertaining to Reach Selection and Layout, Pebble Count Procedure, Cross Sectional Profile, Thalweg Profile, Large Woody Debris Tally and Slope in SWQB SOP 5.0. Procedure will be modified to use a laser level. The HPWA will utilize the SWQB's field sheets for physical habitat measurements which include both level 1 and level 2 sediment/siltation surveys. The field sheets can be located at <https://www.env.nm.gov/surface-water-quality/sop/>.

Stream flow will be collected with a USGS Pygmy Current Meter. Stream flow will be collected in accordance with SWQB SOP 7.0, *Stream Flow Measurement* (NMED/SWQB. 2015b).

Estimation of sediment loading from eroding banks based on field indicators and measurements (i.e., BEHI modeling) will be done in accordance with the instructions provided in the Watershed Assessment of River Stability and Sediment Supply (WARSSS) book.

B3. Sample Handling and Custody

Sample handling and custody will be done in accordance with SWQB SOP 8.2, *Chemical Sampling in Lotic Environments* sections pertaining to Handling, Packaging and Transporting Samples.

B4 Analytical Methods

The TSS analysis of water grab samples collected on the Sapello River will be analyzed at the New Mexico State Laboratory Division located in Albuquerque, NM. The TSS analysis will be conducted by trained laboratory staff and will be analyzed using standardized laboratory protocol for TSS. State Laboratory Department will analyze TSS samples according to SM 2540 D.

Analytical instruments and equipment used by the New Mexico State Laboratory Division are calibrated prior to each instrument analysis batch using manufacturer's recommended procedures

and the guidelines provided in the Handbook for Analytical Quality Control (EPA 1979). All calibrations procedures are validated and documented by the New Mexico State Laboratory Division and are described in the laboratory's QAPP or equivalent.

B5. Quality Control

Quality control (QC) activities are technical activities performed on a routine basis to quantify the variability that is inherent to any environmental data measurement activity. The purpose for conducting QC activities is to understand and incorporate the effects the variability may have in the decision-making process. Additionally, the results obtained from the QC analysis, or data quality assessment, may identify areas where the variability can be reduced or eliminated in future data collection efforts, thereby improving the overall quality of the project being implemented.

Quality Control mechanisms are implemented as described under the Quality Objectives and Criteria for Measurement Data as well as the sampling methodologies identified under this QAPP. Additional Quality Control includes the professional expertise of the personnel working under this project.

B6. Instrument/Equipment Testing, Inspection and Maintenance

The primary equipment needing maintenance, testing and inspection are a sonde, flow meter and laser level. Requirements and procedures are specified in the SWQB SOPs (below) and manufacture specification for Pro Shot Laser Level

1. YSI 6920 V2 Sonde, SWQB SOP 6.1, *Sonde Calibration and Maintenance* (NMED/SWQB. 2018a)
2. USGS Pygmy Current Meter, SWQB SOP 7.0, *Stream Flow Measurements* Attachment 2 (NMED/SWQB. 2015b).

B7. Instrument/Equipment Calibration and Frequency

A calibration log will be kept maintained for the duration of the project for all monitoring devices. Procedures for the maintenance of calibration records are specified in the SWQB's QAPP for *Water Quality Management Programs* (NMED/SWQB. 2018c) and SWQB SOPs. For this project, specific calibration requirements apply to sondes, flow meters, and laser levels. Sondes will be calibrated according to SOP 6.1 *Sonde Calibration and Maintenance* (NMED/SWQB. 2018a) before and after deployment. Flow meters will be calibrated according to SWQB SOP 7.0, *Stream Flow Measurements* (NMED/SWQB. 2015b). Laser level will be maintained and calibrated annually to manufacture specifications.

B8. Inspection/Acceptance of Supplies and Consumables

Consumables that have potential to affect the quality of data collected during the project are calibration standards solutions and grab sample containers for nutrient sampling. HPWA staff will visually inspect calibration standard solutions for contamination and ensure expiration date has not been exceeded before each use. Calibration standard solution will be stored in conditions as specified by manufacturer specifications. This project will use new grab sample containers at each monitoring site for each sample run and handle container in accordance with SWQB SOP 8.2 Chemical Sampling in Lotic Environments, section pertaining to Collecting Water Samples.

B9. Non-direct Measurements see example below

No non-direct measurements used during the course of this project that will affect the quality of data related to this project.

B10. Data Management

Data obtained for this project are maintained in paper and electronic files by SWQB Project Officer and HPWA Project Manager. Original hardcopy project document data sheets will be kept by the HPWA Project Manager. Data collected by HPWA staff will be housed by HPWA Project manager and delivered to SWQB Project Officer as soon as practical following the data collection event. HPWA Project Manager will ensure original hardcopy project documents are scanned and then transferred to the SWQB Project Officer no later than 3 months after data collection. All data will be maintained in the project file at the NMED SWQB. Electronic data will be backed up on the SWQB network storage and the hard drive of SWQB Project Officer in Santa Fe, NM.

C. ASSESSMENT AND OVERSIGHT

C1. Assessment and Response Actions

The SWQB Project Officer will provide project oversight by periodically assisting with and/or reviewing data collection efforts. SWQB Project Officer will conduct quarterly reviews of data collection efforts. The SWQB Project Officer will assess project progress to ensure the QAPP is being implemented, including periodic audits by the QAO, as needed. Any problems encountered during the course of this project will be immediately reported to the SWQB Project Officer who will consult with appropriate individuals to determine appropriate action. Should the corrective action impact the project or data quality, the SWQB Project Officer will alert the QAO. If it is discovered that monitoring methodologies must deviate from the approved QAPP, a revised QAPP must be approved before work can be continued. All problems and adjustments to the project plan will be documented in the project file and included in the final report.

C2. Reports to Management

An initial report after field work has been completed will be filed by HPWA Project Manager with the SWQB Project Officer no later than 4 weeks following completion of the field data collection. This will include days spent, data collection locations, raw data files, and any factors which may have affected data quality (personnel substitutions, equipment malfunctions, inclement weather, etc.).

Semiannual reports are submitted by the HPWA Project Manager to the SWQB Project Officer and include progress of project implementation and any available data. Printouts, status reports or special reports for SWQB or EPA will be prepared upon request. Separate annual monitoring reports will also be provided and included in the final report. The SWQB Project Officer will be responsible for maintaining project progress in the EPA Grants Reporting and Tracking System and the final report, and all other required project deliverables to be submitted to the EPA under this grant.

D. DATA VALIDATION AND USABILITY

D1. Data Review, Verification and Validation

Data will be reviewed by the HPWA Project Coordinator prior to demobilization from the field site. Data will be considered usable if there is reasonable evidence that the requirements of this QAPP were followed and the data is within acceptable range limits as defined under this QAPP. Data that appears incomplete or questionable for the parameter will be flagged for review. Flagged data will be discussed with the SWQB Project Officer to determine the potential cause and usability. If a reasonable justification for use of the data cannot be attained, those data will be not used in development of the WBP for the Sapello River unless the data can be recollected and assessed for usability.

D2. Validation and Verification Methods

The HPWA Project Manager will ensure that valid and representative data are acquired. Verification of field sampling and analytical results will occur in the review of data performed by HPWA Project Manager in accordance with all applicable sections of the SWQB's SOP for *Data Verification and Validation* (NMED/SWQB. 2016a). In the event gross errors or other questionable data are found, the HPWA Project Coordinator will consult with project personnel (e.g., WPS Project Manager or QAO) to determine the validity of the data. The SWQB Project Officer or QAO will also ensure the completeness of records and verification of calibration. Results of the verification process will be included in the final reports to the SWQB Project Officer.

D3. Reconciliation with User Requirements

The user requirement is a restatement of the data quality objective: The quality of the data will be adequate to provide a high level of confidence in the development of the WBP for the Sapello River Watershed.

If project results do not meet this requirement, then additional monitoring may be necessary to fill in data gaps or it may be necessary to extend the monitoring period to measure effects that were not apparent during the project period.

E. REFERENCES

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- New Mexico Environment Department Surface Water Quality Bureau (NMED/SWQB), 2015a. Standard Operating Procedures for *Chemical Sampling in Lotic Environments-Equipment, Collection Methods, Preservation and Quality Control*. Accessed at: <https://www.env.nm.gov/swqb/SOP/documents/82ChemicalSamplingSOP4-11-2016.pdf>.
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- New Mexico Environment Department Surface Water Quality Bureau (NMED/SWQB), 2016b. or most current version. Standard Operating Procedures for *Physical Habitat Measurements*. Accessed at: https://www.env.nm.gov/swqb/SOP/documents/5.0_Physical_Habitat_SOP_4-11-2016.pdf
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- New Mexico Environment Department Surface Water Quality Bureau (NMED/SWQB), 2018a. Standard Operating Procedures for *Sonde Calibration and Maintenance*. Accessed at: https://www.env.nm.gov/wp-content/uploads/2017/06/SOP-6_1_20180122.pdf

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New Mexico Environment Department Surface Water Quality Bureau (NMED/SWQB), 2019. Quality Management Plan for New Mexico Department Surface Water Quality Bureau Environmental data Operations. Accessed at: <https://www.env.nm.gov/wp-content/uploads/2017/03/2020-SWQB-Quality-Management-Plan-EPA-approved.pdf>

Appendix 1. QAPP Acknowledgement Form



New Mexico Environment Department Surface Water Quality Bureau

Water Quality Monitoring to Determine Pollutant Loading Sources for the Development of the Sapello River Watershed Based Plan

Quality Assurance Project Plan Acknowledgement Statement

This is to acknowledge that I have received a copy Water Quality Monitoring to Determine Pollutant Loading Sources Quality Assurance Project Plan.

As indicated by my signature below, I understand and acknowledge that it is my responsibility to **read, understand, become familiar with and comply** with the information provided in the document to the best of my ability.

Signature

Name (Please Print)

Date

Return to SWQB QAO